An Economic Study of Date Palms in North Sinai Governorate

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ABSTRACT

The study has given an attention to the production of date palms in North Sinai governorate. It, also, has concerned with identifying the productivity and production per feddan in North Sinai governorate. It is turned out that the cultivated area of palm crop in North Sinai governorate has reached to about 10.145 thousand feddans, at a relative importance reached to about 26.1% of the total area cultivated of palm trees outside the Valley of the State. This total area has reached to about 39.891 thousand feddans in 2013. Also, it is shown that North Sinai governorate contributes to the total production by about 27.049 thousand tons, at a relative importance reached to about 21.7% of the total production of palms, at the level of the State, which has reached to about 124.706 thousand tons. It is shown that the governorate suffers from a relative deficiency of productivity per feddan compared to the State. In addition, it is turned out that the New Valley governorate occupies the first place in terms of space by about 16.115 thousand feddans, and an amount of production estimated at about 94.801 thousand tons. The New Valley governorate is followed by the governorates of Matrouh, Nubaria and North Sinai that have areas estimated at 7.172, 5.314 and 10.145 thousand feddans. Moreover, it is shown that the cultivated area of palm crop in North Sinai governorate during the period (2004 – 2013) has ranged between a minimum reached to about in 2004, representing about 95.9% of the period's average which has reached to about 8465.5 feddans, and a maximum reached to about 8692 feddans, representing about 102.6% of the average of the period under study. Furthermore, it is shown that the productivity per feddan of palm crop in North Sinai governorate during the period (2004 – 2013) has ranged between a minimum reached to about 54 kg / palm in 2004, representing about 87.6% of the period's average which has reached to about 61.6 kg / palm, and a maximum reached to about 75.4 kg / palm in (2013), representing about 122.4% of the average of the period under study. It is turned out that the total production of the cultivated area of palm crop in North Sinai governorate during the period (2004 – 2013) has ranged between a minimum reached to about 15.125 thousand tons in 2004, representing about 78.5% of the period's average which has reached to about (19.26) thousand tons, and a maximum reached to about 27.049 thousand tons in (2013), representing about 140.6% of the average of the period under study. In addition, it is shown that one of the most important centers cultivated of palms is Al-Arish center, as the area has ranged between a minimum reached to about 2.76 thousand feddans in 2007, representing about 32.85.5% of the total area of the centers during the same period, and a maximum reached to about 2.8 thousand feddans in 2013, representing about 31.8% of the total cultivated area in those centers for the same year. It is turned out that the cultivated area in the centers of Bear Al-Abd, Rommanah and Al-Sheikh Zuwaid has reached to about 2.8 thousand feddans, 2.3 thousand feddans and 0.735 thousand feddans respectively in 2013, representing about 32.5%, 26.7% and 8.5% of the total cultivated area in those centers in North Sinai governorate for 2013. Also, it is shown that the total production of the cultivated area of palm crop in North Sinai governorate during the period (2004 – 2013) has ranged between a minimum reached to about 15.125 thousand tons in 2004, representing about 78.5% of the period's average which has reached to about 19.266 thousand tons, and a maximum reached to about 27.049 thousand tons in (2013), representing about 140.4% of the average of the period under study. However, an insufficiency in the productivity per feddan is shown during the most of the years of study except for 2010, 2011 and 2013. A relative superiority has been achieved for productivity per feddan in North Sinai governorate compared to the State. Moreover, the relative insufficiency of the productivity per feddan of the average of the period (2004 - 2013) is shown at a rate reached to about 61.6%. This is due to that this governorate depends on rains as a main source of irrigation, which affects the reduction of productivity per feddan in this governorate compared to the State, which depends on more stable sources of irrigation to irrigate the crop. In addition, the fluctuation of the relative importance of the production of palm crop in North Sinai governorate is shown for the State during study period.

Key words: Date Palms, production, North Sinai, Economic Study

Introduction

Date palms have a high nutritional value and they occupy center stage distinctively among the other agricultural products. In addition, they can be considered full food as they contain sugars, protein, potassium

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minirals and vitamins. Palm is an environment-friendly because human can benefit from all its wastes. The cultivation of palm trees spreads in most of the State's governorates and there are about 14 million palms. Moreover, the cultivated area of palm trees represents about 95.42 thousand feddans in 2013, representing about 6.19% of the total area cultivated by fruits. The annual production of dates represents about 1.465 million tons / dates, representing about 15.93% of the total production of fruit in Egypt. These dates come from about 13.265 million fruitful palms. It is turned out that the cultivated area of palm crop in North Sinai governorate represents about 10.145 thousand feddans, at a relative importance reached to about 26.1% of the total area cultivated of palm trees outside the Valley of the State. This total area has reached to about 39.891 thousand feddans in 2013. It is shown that North Sinai governorate contributes to the total production by about 27.049 thousand tons at a relative importance reached to about 21.7% of the total production of palms at the level of the State. Moreover, it is shown that the cultivated area of palm crop in North Sinai governorate has ranged between a minimum reached to about 8121feddans in 2004, representing about 95.9% of the period's average which has reached to about 8465.5 feddans, and a maximum reached to about 8692 feddans, representing about 102.6% of the average of the period under study. This increase is due to the expansion of the cultivated area of palm trees in the governorates of Matrouh, New Valley, North Sinai, Red Sea, Nubaria, Toshka and Owaynat. Due to the difference and variation of climatic conditions in Egypt, wet and half dry sorts have been spread in the regions of Delta and Middle Egypt. However, the regions of Upper Egypt and Aswan are considered unique because of having the dry sorts.

Furthermore, palms need to relatively high temperatures and low relative humidity in order to produce fruits, having good qualities, and high crop. Their sorts are divided into wet group that includes Zaghloul and Sammani, which are spread in the regions of Adco and Rashid in Lower Egypt, and Bent Aisha, Hayani, Orabi and Saraji in Alexandria, Damietta, Marg and Qalubia. Amhat is spread in Giza and Fayoum. In addition to the wet crop, there is the group of dry sorts which includes Al-Malkaby, Al-Scotty, Al-Bermuda, Al-Gandila, Aidgna, Al-Shamya, Al-Brackway, and Al-Gragouda. The most important regions producing such sorts are the governorates of Aswan and Sinai.

Research Problem: -

Due to the importance of cultivating palms, development shall be made in increasing their production, as Egypt's production of dates reaches to about 1465.2 thousand tons and the average of palm's productivity reaches to about 117 kg / year. Although North Sinai governorate is one of the governorates producing date palms, its production and productivity are low, as its production reaches to about 27.1 thousand tons in 2012 and the average of palm's productivity reaches to about 61 kg compared to the governorates of Matrouh and New Valley. This requires identifying the reasons of the low average of their productivity in North Sinai.

Aim of Research: -

The aim of this research is identifying the current status of the total production, productivity and the cultivated area and identifying the number of the females producing palms at the level of the State and North Sinai governorate. It aims also to determine the most important factors affecting the production and determine production problems and the proposals to solve these problems and overcome them.

Method of Research: -

The study has used the qualitative and quantitative method in order to describe some variables affecting palms' production. Also, general trend equations have been used in order to know how the variables and the factors affecting palms production are affected in North Sinai governorate in the time period.
Moreover, the study has relied on the primary and secondary data, which are published and unpublished, represented in the Directorate of Agriculture in North Sinai governorate, the Central Administration of the Agricultural Economy, the Central Agency for Public Mobilization and Statistics and the F.A.O.Organization.

First: - The evolution of the area and production of the numbers of females fruiting date palms in the Arab state of Egypt during the period (2001 – 2013): -
The evolution of the area, palms' numbers (the females fruiting date palms), the average of their productivity and the total production, in the Arab State of Egypt, has been studied during study period and it has been shown the following: -
The Cultivated Area of Palms during the Period (2001 – 2013): -
It has been shown from table (1) that the cultivated area has reached to about 70.12 thousand feddans in 2001. It has been increased until it reached to about 95.42 thousand feddans in (2013), and the rate of increase is estimated at about 36.1%. By studying the general time trend of the cultivated area of palms during the same period, it is shown from table (2) that the area increases by about 2.21 thousand feddans, at a significant increasing rate reached to about 0.25% annually of the average of the cultivated area of palms that reached to

about 86.21 thousand feddans at the level of the State during study period. The coefficient of determination has reached to about 0.82 which means that 8.2% of the changes in the area are due to the factor of time.

The Evolution of the Numbers of Palms (the females fruiting date palms) in the Arab State of Egypt during the Period (2001 – 2013): -

It has been shown that the number of fruitful females in 2001 has reached to about 10229 thousand palms, and it has been increased due to the increase in the cultivated area of palms and the entry of non-fruitful females to fruiting stage. It is shown from table (1) that the numbers of fruitful females have reached to about 13265 thousand palms in 2013. The numbers of fruitful palms have been increased by an increasing rate estimated at about 29.6%. By studying the number of fruitful females during the same period, it is shown from table (2) that the numbers of the fruitful females increases by about 218 thousand feddans, at a significant increasing rate reached to about 0.18% annually of the average the number of fruitful females that reached to about 11726.88 thousand palms at the level of the State during study period. The coefficient of determination has reached to about 0.92 which means that 9.2% of the changes in the number of fruitful females are due to the factor of time.

The Evolution of Palm's Productivity at the Level of the Arab State of Egypt during the Period (2001 – 2013): -

It is shown from table (1) that the average of the productivity of fruitful palm reaches to about 105.7 kg / palm in 2001. It fluctuate between increase and decrease until it reached to about 110.45 kg / palm at an increasing proportion estimated at about 4.4%. By studying the general time trend of the average of the productivity of fruitful palm during the same period, it is shown from table (2) that the average of the productivity of fruitful palm increased by about 0.28 kg / palm, at a significant increasing rate reached to about 0.03% annually of the average of the productivity of fruitful palm that reached to about 107.43 kg / year at the level of the State. The coefficient of determination has reached to about 0.19 which means that 1.9% of the changes in the average of the productivity of fruitful palm are due to the factor of time during study period.

Table 1: The evolution of the area, the numbers of fruitful female palms and the average of production and total production in the Arab state of Egypt for the period (2001 – 2013)

Year	Area per Thousand Feddans	Number of Fruitful Females per Thousand Palms	Average of Productivity kg / year	Total Production per Thousand Tons
2001	70.12	10229.6	105.7	959.39
2002	70.52	10378.4	105.03	913.57
2003	78.07	10735.6	104.03	928.28
2004	82.17	11209.5	104.7	971.03
2005	86.08	11402.9	111.77	961.58
2006	85.18	11888.02	109.12	111.09
2007	86.78	12039.4	108.85	1167.31
2008	87.69	12183.3	104.62	1183.58
2009	87.92	12143.3	111.10	1153.16
2010	99.87	12177.4	112.22	1219.45
2011	99.17	12261.6	97.36	1193.78
2012	91.67	12534.8	111.69	1400.10
2013	95.42	13265.6	110.45	1465.18
Total	1120.67	152449.42	1396.64	13627.5
Average	86.21	11726.88	107.43	1048.27

Source: Ministry of Agriculture and Land Reclamation, Economic Affairs Sectors, the Central Administration of Agricultural Economics, bulletins of Agricultural Economics, various issues.

The Evolution of the Total Production at the Level of the Arab State of Egypt during the Period (2001 – 2013): -

Egypt is one of the countries that occupy an advanced rank in producing dates among the developed countries in the world, as its total production of date palms has reached to about 959.39 thousand tons in (2001), and it increases gradually until it reached to about 1465.18 thousand tons in 2013. The rate of increase has estimated at about 52.7% for 2001. By studying the general time trend of the average of the total production during the same period, it is shown from table (2) that the total production increases by about 47.9 thousand tons, at a significant increasing rate reached to about 0.045% annually of the average of the total production that reached to about 1048.27 thousand tons at the level of the State. Moreover, the statistical significance of that increase has been fixed, and the coefficient of determination has reached to about 0.25 which means that 2.5% of the changes in the total production are due to the increase in the number of fruitful females resulting from cultivating new areas of palms, in addition to the increase in the productivity per feddan.

Table 2: Estimating the features of the general time trend of some of palms' variables in the Arab state of Egypt for the period (2001 – 2013)

Variable	Unit	Equation	R^2	F	Rate of Change %	Significance
The Area	Thousand feddans	Y^ = 70.77 + 2.204XI (7.377)**	0.816	54.42	0.25	**
The Number of Fruitful Females	Thousand palms	Y^ = 1019.81 + 218.58 XI (11.4)**	0.915	130.20	0.18	**
The Average of Productivity	Kg / year	Y^ = 105.44+ 0.2844XI (0.881)*	-0.019	0.774	0.03	*
The Total production	Per thousand tons	Y^ = 712.48 + 47.968XI (2.256)**	0.254	5.090	0.45	**

Source: - collected and calculated from Table (1).

Y^ = the estimated value of the area in the year I   - Xi = variable time, (I) 1, 2 13

A , B= Indicates to reduce hard, and the regression coefficient of the equation, respectively.

(**) Indicates a significant regression model or when the level of significance (0.01).

(*) Refers to the moral at the level of significance (0.05).

R^2 =average coefficient of determination

(F) = F value calculated . ( ) the value in brackets is the calculated value of T.

Second: - the Evolution of the Area, Production and Productivity of Date Palms Distributed over the Main Areas of Production in the Arab State of Egypt during the period (2001 – 2013): -

The evolution of the cultivated area of palms distributed over the main areas of production at the level of the state during the period (2001 – 2013):

It is shown from table (3) that the cultivated area of the main areas of production has reached to about 25.5, 7.84, 38.81 and 31.32 thousand feddans in 2001 for the total of Lower Egypt, Middle Egypt and inside and outside the Valley, respectively. Then it increased until it reached to about 27.98, 12.91, 53.11, and 39.93 thousand feddans, respectively. By studying the general time trend of the cultivated area of palms in the main areas of production during the same period, it is shown from table (4) that the area increases in Lowe Egypt by about 0.23 thousand feddans, at a significant increasing rate reached to about 0.085% annually of the average of the cultivated area of palms in Lowe Egypt that reached to about 27.87 thousand feddans. The coefficient of determination has reached to about 0.26 which means that 2.6% of the changes in the area are due to the factor of time.

By studying the general time trend of the cultivated area of palms in the main areas of production during the same period, it is shown from table (4) that the area increases in Middle Egypt by about thousand feddans, at a significant increasing rate reached to about 0.41% annually of the average of the cultivated area of palms in Middle Egypt that reached to about 11.27 thousand feddans. The coefficient of determination has reached to about 0.36 which means that 3.6% of the changes in the area are due to the factor of time.

By studying the general time trend of the cultivated area of palms in the main areas of production during the same period, it is shown from table (4) that the area has been increased inside the Valley from about 38.8 thousand feddans in 2001 to about53.11 thousand feddans in 2013 at an increasing rate estimated at about 36.8%. Moreover, the area has increased by about 1.1 thousand feddans, at a significant increasing rate reached to about 0.022% annually of the average of the cultivated area of palms inside the Valley that reached to about 50.63 thousand feddans. The coefficient of determination has reached to about 0.54 which means that 5.4% of the changes in the area are due to the factor of time.

By studying the general time trend of the cultivated area of palms in the main areas of production during the same period, it is shown from table (4) that the area has been increased outside the Valley from about 31.3 thousand feddans in 2001 to about39.9 thousand feddans in 2013 at an increasing rate estimated at about 27.4%. Moreover, the area has increased by about 0.98 thousand feddans, at a significant increasing rate reached to about 0.027% annually of the average of the cultivated area of palms outside the Valley that reached to about 35.5 thousand feddans. The coefficient of determination has reached to about 0.53 which means that 5.3% of the changes in the area are due to the factor of time.

Third: - The evolution of the number of females fruiting date palms distributed over the main areas of production in the Arab state of Egypt for the period (2001 – 2013): -

The Evolution of the Numbers of Palms (Females Fruiting Date Palms) Distributed over the Main Areas of Production in the Arab State of Egypt for the Period (2001 – 2013): -

It is shown from table (5) that the number of fruitful females in Lower Egypt has been increased from about 4379.1 thousand palms in 2001 to about 5491.3 thousand palms in 2013, at a rate of increase estimated at about 25.3%. By studying the general time trend of the numbers of females fruiting date palms in Lower Egypt during the same period, it is shown from table (6) that the numbers fruitful females decreases by about 8.8 thousand palms, at a decreasing rate reached to about 0.002% annually of the average of the number of fruitful females in Lower Egypt that reached to about 4770.2 thousand palms during study period. The coefficient of

determination has reached to about 0.091 which means that 9.1% of the changes in the number of fruitful females are due to the factor of time.

Table 3: The evolution of the cultivated area of date palms distributed over the main areas of production in the Arab state of Egypt for the period (2001 – 2013)

Year	The Total of the State	The Total of Lower Egypt	%	The Total of Middle Egypt	%	The Total of Inside the Valley	%	The Total of Outside the Valley	%
				Per Thousand feddans					
2001	70.13	25.5	36.4	7.84	11.2	38.81	55.3	31.32	44.6
2002	70.52	25.22	35.77	7.87	11.1	38.71	54.8	31.81	45.1
2003	78.07	26.6	34.1	7.78	9.9	46.63	59.7	31.43	40.3
2004	82.17	26.23	31.9	11.34	13.8	49.57	60.3	32.59	39.6
2005	86.08	28.46	33.1	12.47	14.4	53.17	61.7	32.9	38.2
2006	85.18	28.66	33.6	12.07	14.2	52.7	61.8	34.38	40.4
2007	86.78	29.54	33.9	12.23	14.09	54.26	62.5	32.52	37.5
2008	87.69	29.97	34.1	12.40	14.1	55.34	63.1	32.35	26.9
2009	87.92	29.56	33.6	12.21	13.9	54.72	62.2	33.19	37.7
2010	99.87	29.49	29.5	12.37	12.4	54.86	54.9	45.0	45.1
2011	99.17	28.13	28.4	12.38	12.5	53.57	54	45.60	45.98
2012	91.67	27.03	29.5	12.63	13.8	52.78	57.5	38.89	42.42
2013	95.42	27.98	29.3	12.91	13.5	53.11	55.7	39.93	41.84
Total	1120.67	362.37	-	146.5	-	658.23	-	461.91	-
Average	86.21	27.87	-	11.27	-	50.63	-	35.53	-

Source: - Ministry of Agriculture and Land Reclamation, Economic Affairs Sectors, the Central Administration of Agricultural Economics, bulletins of Agricultural Economics, various issues.

Table 4: Estimating the features of the general time trend of the evolution of the cultivated area of date palms distributed over the main areas of production in the Arab state of Egypt for the period (2001 – 2013)

Variable	Unit	Equation	R^2	F	Rate of Change %	Significance
The Total of the State	Thousand Feddans	$Y^{\wedge} = 70.77 + 2.204XI\,(2.45\,)^{**}$	0.816	54.42	0.028	**
The Total of Lower Egypt	Thousand Feddans	$Y^{\wedge} = 26.207 + 0.238XI\,(2.32\,)^{**}$	0.267	5.39	0.085	**
The Total of Middle Egypt	Thousand Feddans	$Y^{\wedge} = 8.364 + 0.4154XI\,(4.596\,)^{**}$	0.626	21.125	0.036	**
The Total of Inside the Valley	Thousand Feddans	$Y^{\wedge} = 42.72 + 10129XI\,(3.910\,)^{**}$	0.543	15.28	0.022	**
The Total of Outside the Valley	Thousand Feddans	$Y^{\wedge} = 28.626 + 0.986XI\,(3.804\,)^{**}$	0.528	14.47	0.027	**

Source: - collected and calculated from Table (3).
Yh = the estimated value of the area in the year I   -   Xi = variable time, (I) 1, 2 13
A , B= Indicates to reduce hard, and the regression coefficient of the equation, respectively.
(**) Indicates a significant regression model or when the level of significance (0.01).
(*) Refers to the moral at the level of significance (0.05).
R^2 =average coefficient of determination
(F) = F value calculated . ( ) the value in brackets is the calculated value of T.

The Evolution of the Numbers of Palms (Females Fruiting Date Palms) Distributed over the Main Areas of Production in the Arab State of Egypt for the Period (2001 – 2013): -

It is shown from table (5) that the number of fruitful females in Middle Egypt has been increased from about 1875.4 thousand palms in 2001 to about 2267.4 thousand palms in 2013, at a rate of increase estimated at about 20.9%. By studying the general time trend of the numbers of females fruiting date palms in Middle Egypt during the same period, it is shown from table (6) that the numbers fruitful females increases by about 34.4 thousand palms, at a significant increasing rate reached to about 0.016% annually of the average of the number of fruitful females in Middle Egypt that reached to about 2065.3 thousand palms during study period. The coefficient of determination has reached to about 0.75 which means that 7.5% of the changes in the number of fruitful females are due to the factor of time.

The Evolution of the Numbers of Palms (Females Fruiting Date Palms) Distributed over the Main Areas of Production in the Arab State of Egypt for the Period (2001 – 2013): -

It is shown from table (5) that the number of fruitful females inside the Valley has been increased from about 8445.1 thousand palms in 2001 to about 10150 thousand palms in 2013, at a rate of increase estimated at

about 20.1%. By studying the general time trend of the numbers of females fruiting date palms inside the Valley during the same period, it is shown from table (6) that the numbers fruitful females increases by about 128.8 thousand palms, at a significant increasing rate reached to about 0.013% annually of the average of the number of fruitful females inside the Valley that reached to about 9545.5 thousand palms during study period. The coefficient of determination has reached to about 0.88 which means that 8.8% of the changes in the number of fruitful females are due to the factor of time.

The Evolution of the Numbers of Palms (Females Fruiting Date Palms) Distributed over the Main Areas of Production in the Arab State of Egypt for the Period (2001 – 2013): -

It is shown from table (5) that the number of fruitful females outside the Valley has been increased from about 1783.6 thousand palms in 2001 to about 2516.6 thousand palms in 2013, at a rate of increase estimated at about 41.1%. By studying the general time trend of the numbers of females fruiting date palms outside the Valley during the same period, it is shown from table (6) that the numbers fruitful females increases by about 39.9 thousand palms, at a significant increasing rate reached to about 0.018% annually of the average of the number of fruitful females outside the Valley that reached to about 2135.3 thousand palms during study period. The coefficient of determination has reached to about 0.52 which means that 5.2% of the changes in the number of fruitful females are due to the factor of time.

Table 5: The evolution of the numbers of females fruiting date palms distributed over the main areas of production in the Arab state of Egypt for the period (2001 – 2013)

	Per Thousand Palms								
Year	The Total of the State	The Total of Lower Egypt	%	The Total of Middle Egypt	%	The Total of Inside the Valley	%	The Total of Outside the Valley	%
2001	10229.6	4379.1	42.8	1875.4	18.3	8445.9	82.6	1783.6	17.4
2002	10378.3	4348.8	41.9	1967.3	18.9	8522.3	82.2	1856.0	17.8
2003	10735.6	4755.9	44.3	1723.2	16.0	8653.6	80.6	2082.0	19.4
2004	11209.5	4912.2	43.8	2008.9	17.9	9170.8	81.8	2038.7	18.2
2005	11402.9	4960.6	43.5	2062.4	18.1	9325.2	81.8	2077.8	18.2
2006	11888	5343	44.9	1979.7	16.6	9635.5	81.1	2252.5	18.9
2007	12039.4	5291.1	43.9	2082.7	17.3	9747.9	80.9	2291.5	19.0
2008	12183.3	5463.8	44.8	2151.7	17.9	9936.1	81.6	2246.9	18.4
2009	12143.4	5532.2	45.6	2177.2	17.9	10108.9	83.2	2034.6	16.8
2010	12177.4	5599.7	45.9	2143.2	17.6	10124.5	83.1	2052.9	16.9
2011	12261.6	512.4	44.9	2205.4	18.0	10170.3	82.9	2091.3	17.1
2012	12534.8	5422.6	43.3	2204.5	17.6	10100.1	80.6	2434.8	19.4
2013	13265.6	5491.3	41.4	2267.4	17.1	10150.3	76.5	2516.6	18.9
Total	152449.4	62012.7	-	26849	-	124091.4	-	27759.2	-
Average	11726.8	4770.2	-	2065.3	-	9545.5	-	2135.3	-

Source: - Ministry of Agriculture and Land Reclamation, Economic Affairs Sectors, the Central Administration of Agricultural Economics, bulletins of Agricultural Economics, various issues.

Table 6: Estimating the features of the general time trend of the evolution of the numbers of females fruiting date palms distributed over the main areas of production in the Arab state of Egypt for the period (2001 – 2013)

Variable	Unit	Equation	R^2	F	Rate of Growth %	Significance
The Total of the State	Thousand Palms	$Y^\wedge = 1019.78 + 218.584XI\ (11.41)^{**}$	0.915	130.20	0.018	**
The Total of Lower Egypt	Thousand Palms	$Y^\wedge = 4831.95 - 8.820XI\ (-0.084)$	0.091	0.0071	0.002	-
The Total of Middle Egypt	Thousand Palms	$Y^\wedge = 1824.103 + 34.457XI\ (6.126)^{**}$	0.752	37.53	0.016	**
The Total of Inside the Valley	Thousand Palms	$Y^\wedge = 8433.519 + 128.853XI\ (9.448)^{**}$	0.881	89.27	0.013	**
The Total of Outside the Valley	Thousand Palms	$Y^\wedge = 1855.33 + 39.998XI\ (3.727)^{**}$	0.517	13.89	0.018	**

Source: - collected and calculated from Table (5).
Yh = the estimated value of the area in the year I - Xi = variable time, (I) 1, 2 .....13.
A , B= Indicates to reduce hard, and the regression coefficient of the equation, respectively.
(**) Indicates a significant regression model or when the level of significance (0.01).
(*) Refers to the moral at the level of significance (0.05).
R^2 =average coefficient of determination
(F) = F value calculated . ( ) the value in brackets is the calculated value of T.

Forth: - The evolution of the productivity of fruitful palm distributed over the main areas of production at the level of the Arab state of Egypt during the period (2001 – 2013): -

It is shown from table (7) that the productivity of fruitful palm in Lower Egypt has been increased from about 130.6 kg / palm in 2001 to about 133.7 kg / palm in 2013, at a rate of increase estimated at about 2.3%. By studying the general time trend of the productivity of palm fruiting date palms in Lower Egypt during the same period, it is shown from table No (8) that the productivity of fruitful palm increases by about 0.74 kg / palm, at a significant increasing rate reached to about 0.056% annually of the average of the productivity of fruitful palm in Lower Egypt that reached to about 131.7 kg / palm during study period. The coefficient of determination has reached to about 0.12 which means that 1.2% of the changes in the number of fruitful females are due to the factor of time.

It is shown from table (7) that the productivity of fruitful palm in Middle Egypt has been increased from about 109.3 kg / palm in 2001 to about 117.9 kg / palm in 2013, at a rate of increase estimated at about 7.8%. By studying the general time trend of the productivity of palm fruiting date palms in Middle Egypt during the same period, it is shown from table No (8) that the productivity of fruitful palm increases by about 2.1kg / palm, at a significant increasing rate reached to about 0.019% annually of the average of the productivity of fruitful palm in Middle Egypt that reached to about 107.2 kg / palm during study period. The coefficient of determination has reached to about 0.43 which means that 4.3% of the changes in the number of fruitful females are due to the factor of time.

It is shown from table (7) that the productivity of fruitful palm inside the Valley has been increased from about 113.6 kg / palm in 2001 to about 117.5 kg / palm in 2013, at a rate of increase estimated at about 3.4%. By studying the general time trend of the productivity of palm fruiting date palms inside the Valley during the same period, it is shown from table (8) that the productivity of fruitful palm increases by about 1.01 kg / palm, at a significant increasing rate reached to about 0.008% annually of the average of the productivity of fruitful palm inside the Valley that reached to about 113.7 kg / palm during study period. The coefficient of determination has reached to about 0.39 which means that 3.9% of the changes in the number of fruitful females are due to the factor of time.

It is shown from table (7) that the productivity of fruitful palm outside the Valley has been increased from about 86.3 kg / palm in 2001 to about 82.8 kg / palm in 2013, at a rate of increase estimated at about 3.4%. By studying the general time trend of the productivity of palm fruiting date palms outside the Valley during the same period, it is shown from table (8) that the productivity of fruitful palm decreases by about 1.7 kg / palm, at a significant decreasing rate reached to about 0.022% annually of the average of the productivity of fruitful palm outside the Valley that reached to about 81.4 kg / palm during study period. The coefficient of determination has reached to about 0.17 which means that 1.7% of the changes in the number of fruitful females are due to the factor of time.

Table 7: The Evolution of the Productivity of Palms Fruiting Dates Distributed over the Main Areas of Production in the Arab State of Egypt for the Period (2001 – 2013)

				Kg / palm					
Year	The Total of the State	The Total of Lower Egypt	%	The Total of Middle Egypt	%	The Total of Inside the Valley	%	The Total of Outside the Valley	%
2001	108.8	130.6	119.9	109.3	100.4	113.6	104.4	86.3	79.3
2002	105.0	134.9	118.9	93.6	89.1	107.2	102.1	95.1	90.5
2003	104.5	121.3	116.1	96.0	91.8	107.3	102.7	93.0	88.9
2004	104.0	122.3	117.5	94.9	91.2	105.9	101.8	95.7	92.0
2005	101.7	121.3	119.3	83.3	81.8	103.1	101.4	95.3	93.7
2006	111.8	134.9	120.6	105.0	93.9	115.9	103.7	94.0	84.1
2007	109.1	140.9	129.1	112.4	103.0	119.8	109.8	63.9	58.5
2008	108.9	134.1	123.2	122.7	112.7	119.1	109.4	63.5	58.3
2009	104.6	129.7	123.9	111.4	106.5	114.1	109.1	57.7	55.1
2010	111.1	140.9	126.8	111.5	100.4	120.4	108.4	65.0	58.5
2011	112.0	133.8	119.4	118.1	105.5	118.0	105.4	82.9	74.0
2012	115.5	133.7	115.7	117.7	101.9	117.1	101.4	82.7	71.6
2013	113.75	133.75	117.6	117.9	103.6	117.5	103.4	82.8	72.8
Total	1410.75	1712.15	-	1393.8	-	1479	-	1057.9	-
Average	108.52	131.70	-	107.22	-	113.77	-	81.38	-

Source: - Ministry of Agriculture and Land Reclamation, Economic Affairs Sectors, the Central Administration of Agricultural Economics, bulletins of Agricultural Economics, various issues.

Table 8: Estimating the features of the general time trend of the evolution of the productivity of fruitful palms distributed over the main areas of production in the Arab state of Egypt for the period (2001 – 2013)

Variable	Unit	Equation	R^2	F	Rate of Growth %	Significance
The Total of the State	Kg / palm	$Y^\wedge$ = 103.273 + 5.749XI (3.129)**	0.422	9.795	0.053	**
The Total of Lower Egypt	Kg / palm	$Y^\wedge$ = 126.523 - 0.740XI (1.619)**	0.119	2.621	0.056	**
The Total of Middle Egypt	Kg / palm	$Y^\wedge$ = 92.438 + 2.111XI (3.187)**	0.433	10.16	0.019	**
The Total of Inside the Valley	Kg / palm	$Y^\wedge$ = 106.67 + 1.0131XI (2.987)**	0.397	8.924	0.008	**
The Total of Outside the Valley	Kg / palm	$Y^\wedge$ = 93.73 - 1.764XI (- 1.861)**	0.171	3.465	0.022	**

Source: - collected and calculated from Table (7).
Y^h = the estimated value of the area in the year I   -   Xi = variable time, (I) 1, 2 ......13.
 A , B= Indicates to reduce hard, and the regression coefficient of the equation, respectively.
 (**) Indicates a significant regression model or when the level of significance (0.01).
 (*) Refers to the moral at the level of significance (0.05).
 R^2 =average coefficient of determination.
 (F) = F value calculated . ( ) the value in brackets is the calculated value of T.

Fifth: - The evolution of the total production of date palms of the main areas of production at the level of the Arab state of Egypt for the period (2001 – 2013): -

It is shown from table (9) that the total production of fruitful date palms in Lower Egypt has been increased from about 571.7 thousand tons in 2001 to about 1458.9 thousand tons in 2013, at a rate of increase estimated at about 155%. By studying the general time trend of the total production of fruitful date palms in Lower Egypt during the same period, it is shown from table (10) that the total production increases by about 18.25 thousand tons, at a significant increasing rate reached to about 0.027% annually of the average of the total production in Lower Egypt that reached to about 675.8 thousand tons during study period. The coefficient of determination has reached to about 0.71 which means that 7.1% of the changes in the total production are due to the factor of time and the increase in the number of fruitful females resulting from cultivating new areas of palms in addition to the increase in productivity per feddan.

It is shown from table (9) that the total production of fruitful date palms in Middle Egypt has been increased from about 205 thousand tons in 2001 to about 267.3 thousand tons in 2013, at a rate of increase estimated at about 30.4%. By studying the general time trend of the total production of fruitful date palms in Middle Egypt during the same period, it is shown from table No (10) that the total production increases by about 8.01 thousand tons, at a significant increasing rate reached to about 0.036% annually of the average of the total production in Middle Egypt that reached to about 219 thousand tons during study period. The coefficient of determination has reached to about 0.76 which means that 7.6% of the changes in the total production are due to the factor of time and the increase in the number of fruitful females resulting from cultivating new areas of palms in addition to the increase in productivity per feddan.

It is shown from table (9) that the total production of fruitful date palms inside the Valley has been increased from about 959.4 thousand tons in 2001 to about 1192.7 thousand tons in 2013, at a rate of increase estimated at about 24.3%. By studying the general time trend of the total production of fruitful date palms inside the valley during the same period, it is shown from table (10) that the total production increases by about 27.08 thousand tons, at a significant increasing rate reached to about 0.025% annually of the average of the total production inside the Valley that reached to about 1089.2 thousand tons during study period. The coefficient of determination has reached to about 0.79 which means that 7.9% of the changes in the total production are due to the factor of time and the increase in the number of fruitful females resulting from cultivating new areas of palms in addition to the increase in productivity per feddan.

It is shown from table (9) that the total production of fruitful date palms outside the Valley has been increased from about 153.9 thousand tons in 2001 to about 208.4 thousand tons in 2013, at a rate of increase estimated at about 35.4%. By studying the general time trend of the total production of fruitful date palms outside the valley during the same period, it is shown from table (10) that the total production decreases by about 0.069 thousand tons, at a significant increasing rate reached to about 0.039% annually of the average of the total production outside the Valley that reached to about 173.6 thousand tons during study period. The coefficient of determination has reached to about 0.091 which means that 1.1% of the changes in the total production are due to the factor of time and the increase in the number of fruitful females resulting from cultivating new areas of palms in addition to the increase in productivity per feddan.

Table 9: The Evolution of the Total Production of Fruitful Date Palms Distributed over the Main Areas of Production in the Arab State of Egypt for the Period (2001 – 2013)

Year	The Total of the State	The Total of Lower Egypt	%	The Total of Middle Egypt	%	The Total of Inside the Valley	%	The Total of Outside the Valley	%
					Per thousand tons				
2001	1113.2	571.7	51.3	205.0	18.4	959.4	86.2	153.9	13.8
2002	1090.0	543.3	49.8	184.1	16.9	913.5	83.8	176.4	16.2
2003	1121.8	576.8	51.4	165.3	14.7	928.3	82.7	193.5	17.2
2004	1166.1	600.7	51.5	190.5	16.3	971.0	83.3	195.1	16.7
2005	1159.6	601.7	51.9	171.7	14.8	961.5	82.9	198.0	17.1
2006	1328.7	720.6	54.2	207.8	15.6	1117.1	84.1	211.6	15.9
2007	1313.6	745.4	56.7	234.1	17.8	1167.3	88.9	146.3	11.1
2008	1326.1	722.5	55.2	214	19.9	1183.5	89.2	142.5	10.7
2009	1270.4	717.4	56.5	242.6	19.1	1153.1	90.8	117.3	9.2
2010	1352.9	788.8	58.3	238.8	17.6	1219.4	90.1	133.5	9.9
2011	1373.5	737.5	53.7	260.3	18.9	1200.1	87.4	173.4	12.6
2012	1400.8	724.4	51.7	266.4	19.1	1192.4	85.1	207.6	14.8
2013	1458.9	734.5	50.4	267.3	18.3	1192.7	81.8	208.4	14.3
Total	16475.6	8785.3	-	2847.9	-	14159.3	-	2257.5	-
Average	1267.35	675.79	-	219.11	-	1089.2	-	173.65	-

Source: - Ministry of Agriculture and Land Reclamation, Economic Affairs Sectors, the Central Administration of Agricultural Economics, bulletins of Agricultural Economics, various issues.

Table 10: Estimating the Features of the General Time Trend of the Evolution of the Total Production of Fruitful Date Palms Distributed over the Main Areas of Production in the Arab State of Egypt for the Period (2001 – 2013)

Variable	Unit	Equation	R^2	F	Rate of Change %	Significance
The Total of the State	Thousand Tons	$\hat{Y} = 1059.107 + 29.749 X_I$ (9.49)**	0.881	90.229	0.023	**
The Total of Lower Egypt	Thousand Tons	$\hat{Y} = 547.996 + 18.256 X_I$ (5.531)**	0.711	30.594	0.027	**
The Total of Middle Egypt	Thousand Tons	$\hat{Y} = 162.98 + 8.012 X_I$ (6.262)**	0.761	39.220	0.036	**
The Total of Inside the Valley	Thousand Tons	$\hat{Y} = 893.93 + 27.08911 X_I$ (6.89)**	0.794	47.532	0.025	**
The Total of Outside the Valley	Thousand Tons	$\hat{Y} = 174.14 - 0.069 X_I$ (-0.028)	-0.091	0.0010	- 0.039	-

Source: - collected and calculated from Table (9).
Y_h = the estimated value of the area in the year I   - X_i = variable time, (I) 1, 2 ....13.
A , B= Indicates to reduce hard, and the regression coefficient of the equation, respectively.
(**) Indicates a significant regression model or when the level of significance (0.01).
(*) Refers to the moral at the level of significance (0.05).
R^2 =average coefficient of determination
(F) = F value calculated . ( ) the value in brackets is the calculated value of T.

Sixth: - The evolution of the area, production, productivity and the numbers of females fruiting date palms in north Sinai governorate during the period (2004 – 2013): -

The evolution of the area, the numbers of palms (the females fruiting date palms), the average of their productivity and the total production, in North Sinai governorate, has been studied during the period (2004 – 2013): -

The Evolution of the Cultivated Area of Palms in North Sinai Governorate during the Period (2004 – 2013): -

It has been shown from table (11) that the cultivated area has reached to about 8121 feddans in 2004. It has been increased until it reached to about 8692 feddans in (2013), and the rate of increase is estimated at about 7.1%. By studying the general time trend of the cultivated area of palms during the same period, it is shown from table (12) that the area increases by about 64.1 feddans, at a significant increasing rate reached to about 0.075% annually of the average of the cultivated area of palms that reached to about 8465 feddans at the level of North Sinai governorate during study period. The coefficient of determination has reached to about 0.919 which means that 9.1% of the changes in the area are due to the factor of time.

The Evolution of the Numbers of Palms (the females fruiting date palms) in North Sinai Governorate during the Period (2004 – 2013): -

It has been shown that the number of fruitful females in 2004 has reached to about 280.1 thousand palms, and it has been increased due to the increase in the cultivated area of palms and the entry of non-fruitful females to fruiting stage. It is shown from table (11) that the numbers of fruitful females have reached to about

358.695 thousand palms in 2013. The numbers of fruitful palms have been increased by an increasing rate estimated at about 28.1%. it has been shown from table (12) that the general time trend of the number of the fruitful females in North Sinai governorate during the same period increases by about 8.861 thousand palms, at a significant increasing rate reached to about 0.029% annually of the average of the number of fruitful females that reached to about 309.482 thousand palms at the level of North Sinai governorate during study period. The coefficient of determination has reached to about 0.872 which means that 8.7% of the changes in the number of fruitful females are due to the factor of time.

The Evolution of Palm's Productivity at the Level of North Sinai Governorate during the Period (2004 – 2013):
It is shown from table (11) that the average of the productivity of fruitful palm in North Sinai governorate reaches to about 54 kg / palm in 2004. It fluctuate between increase and decrease until it reached to about 75.4 kg / palm at an increasing proportion estimated at about 39.6%. By studying the general time trend of the average of the productivity of fruitful palm during the same period, it is shown from table (12) that the average of the productivity of fruitful palm increases by about 2.49 kg / palm, at a significant increasing rate reached to about 0.041% annually of the average of the productivity of fruitful palm that reached to about 61.6 kg / year at the level of North Sinai governorate. The coefficient of determination has reached to about 0.92 which means that 9.2% of the changes in the average of the productivity of fruitful palm are due to the factor of time during study period.

The Evolution of the Total Production at the Level of North Sinai Governorate during the Period (2004 – 2013):
The evolution of the total production of date palms in North Sinai governorate is shown from table No (11), as it reached to about 15.125 thousand tons in (2004), and it increases gradually until it reached to about 27.049 thousand tons in (2013). The rate of increase has estimated at about 78.8% for 2001. By studying the general time trend of the average of the total production during the same period, it is shown from table No (12) that the total production increases by about 1.34 tons, at a significant increasing rate reached to about 0.071% annually of the average of the total production of North Sinai governorate that reached to about 192.66 thousand tons. Moreover, the statistical significance of that increase has been fixed, and the coefficient of determination has reached to about 0.89 which means that 8.9% of the changes in the total production are due to the increase in the number of fruitful females resulting from cultivating new areas of palms, in addition to the increase in the productivity per feddan.

Seventh: - The evolution of the cultivated area of palms at the level of the centers in north sinai governorate during the period (2007 – 2013): -
It is shown from table (13) that the total of the cultivated area at the level of the centers in North Sinai governorate has reached to about 8408 feddans in 2007, and it has increased until it reached to about8672 feddans in (2013). The proportion of increase is estimated at about 3.1%. By studying the general time trend of the total area cultivated of palms during the same period, it is shown from table (14) that the area increases by about 51.9 feddans, at a significant increasing rate reached to about 0.061% annually of the average of the cultivated area of palms that reached to about 8564.57 feddans at the level of the centers in North Sinai governorate during study period. The coefficient of determination has reached to about 0.73 which means that 7.3% of the changes in the area are due to the factor of time.

Table 11: The Evolution of the Area, the Numbers of Fruitful Female Palms, the Average of Production and Total Production in North Sinai Governorate during the Period (2004 – 2013)

Year	Area / Feddan	The Number of Fruitful Females Palm	The Average of Productivity Kg / Palm	Total Production / Ton
2004	8121	280100	54.00	15125
2005	8241	281125	54.11	15222
2006	8321	292325	54.15	15829
2007	8408	293384	55.00	16136
2008	8470	294422	58.22	17141
2009	8414	298512	61.15	18254
2010	8652	312615	65.22	20388
2011	8656	331510	68.46	22695
2012	8680	352140	70.48	24822
2013	8692	358695	75.41	27049
Total	84655	3094828	616.2	192661
Average	8465.5	309482.8	61.6	19266.1

Source: - Ministry of Agriculture-and Land Reclamation, Economic Affairs Center, bulletins of Agricultural Economics, various issues, North Sinai governorate – the Directorate of Agriculture in North Sinai – localization – crop structure – different numbers –

Table 12: Estimating the Features of the General Time Trend of some of the Variables of Palms in North Sinai Governorate for the Period (2004 – 2013)

Variable	Unit	Equation	R^2	F	Rate of Change %	Significance
Area	Feddan	$Y^\wedge = 8113.4 + 64.018XI$ (10.158)**	0.919	103.19	0.0075	**
Fruitful Palms	Palm	$Y^\wedge = 260743.86 + 8861.62$ XI (7.920)**	0.872	62.73	0.029	**
Average of Productivity	Kg / palm	$Y^\wedge = 47.87 + 2.499XI$ (10.301)**	0.921	106.12	0.041	**
Total Production	Ton	$Y^\wedge = 11842.26 + 1349.078XI$ (9.0126)**	0.899	81.22	0.071	**

Source: - collected and calculated from Table (11).
$Y^\wedge$ = the estimated value of the area in the year I   -   Xi = variable time, (I) 1, 2 ....10.
A , B= Indicates to reduce hard, and the regression coefficient of the equation, respectively.
(**) Indicates a significant regression model or when the level of significance (0.01).
(*) Refers to the moral at the level of significance (0.05).
R^2 =average coefficient of determination
(F) = F value calculated ( ) the value in brackets is the calculated value of T.

Also, the evolution of the area of palm at the level of the centers in North Sinai governorate is shown from table (13). It is shown that Al-Arish center has increased from about 2760 feddans in 2007 to about 2767 feddans, at a rate of increase estimated at about 3.2% annually. By studying the general time trend of the cultivated area of palms in Al-Arish center during the same period, it is shown from table No that the area increases by about 1.7 feddans, at a significant increasing rate reached to about 6.19% annually of the average of the cultivated area of palms that reached to about 2764.7 feddans at the level of Al-Arish center in North Sinai governorate during study period. The coefficient of determination has reached to about 0.62 which means that 6.2% of the changes in the area are due to the factor of time. Moreover, it is shown from table (13) that Rafah center has increased from about 29 feddans in 2007 to about 34 feddans, at a rate of increase estimated at about 17.2% annually. By studying the general time trend of the cultivated area of palms in Rafah center during the same period, it is shown from table (14) that the area increases by about 1.1 feddans, at a significant increasing rate reached to about 0.036% annually of the average of the cultivated area of palms that reached to about 30.7 feddans at the level of Rafah center in North Sinai governorate during study period. The coefficient of determination has reached to about 0.79 which means that 7.9% of the changes in the area are due to the factor of time.

It is shown from table (13) that Al-Sheikh Zuwaid center has decreased from about 749 feddans in 2007 to about 735 feddans, at a rate of decrease estimated at about 0.18% annually. By studying the general time trend of the cultivated area of palms in Al-Sheikh Zuwaid center during the same period, it is shown from table (14) that the area decreases by about 1.39 feddans, at a significant decreasing rate reached to about 0.018% annually of the average of the cultivated area of palms that reached to about 747.3 feddans at the level of AL Sheikh Zuwaid center in North Sinai governorate during study period. The coefficient of determination has reached to about 0.16 which means that 1.6% of the changes in the area are due to the factor of time. In addition, it is shown from table (13) that Bear Al-Abd center has decreased from about 2524 feddans in 2007 to about 2809 feddans, at a rate of decrease estimated at about 11.3% annually. By studying the general time trend of the cultivated area of palms in Bear Al-Abd center during the same period, it is shown from table (14) that the area has increased by about 55 feddans, at a significant increasing rate reached to about 0.021% annually of the average of the cultivated area of palms that reached to about 2690.4 feddans at the level of Bear Al-Abd center in North Sinai governorate during study period. The coefficient of determination has reached to about 0.75 which means that 7.5% of the changes in the area are due to the factor of time. Furthermore, it is shown from table (13) that Rommanah center has decreased from about 2332 feddans in 2007 to about 2322 feddans, at a rate of decrease estimated at about 0.4% annually. By studying the general time trend of the cultivated area of palms in Rommanah center during the same period, it is shown from table (14) that the area decreases by about 2.28 feddans, at a significant decreasing rate reached to about 9.8% annually of the average of the cultivated area of palms that reached to about 747.3 feddans at the level of Rommanah center in North Sinai governorate during study period. The coefficient of determination has reached to about 0.56 which means that 5.6% of the changes in the area are due to the factor of time. As for the centers of Al-Hasanah and Nakhl, the area has decreased at a very small proportion, at the level of the centers in North Sinai governorate.

Table 13: The evolution of fruitful palms area per feddan in the centers of north Sinai governorate for the period (2007 – 2013)

Year	Al-Arish	Rafah	Al-Sheikh Zuwaid	Bear AlAbd	Rommanah	Al-Hasanah	Nakhl	Total
2007	2760	29	749	2524	2332	10	4	8408
2008	2760	28	749	2588	2332	10	3	8470
2009	2760	28	749	2539	2323	13	3	8414
2010	2768	30	749	2781	2319	-	5	8652
2011	2769	32	750	2784	2319	-	2	8656
2012	2769	34	750	2808	2317	-	2	8680
2013	2767	34	735	2809	2322	-	5	8672
Average	2764.7	30.7	747.3	2690.4	2323.4	4.71	3.42	8564.57

Source: - North Sinai governorate – the Directorate of Agriculture in North Sinai – localization – crop structure – different numbers

Table 14: Estimating the features of the general time trend of the evolution of fruitful palms area in the centers of north Sinai governorate for the period (2007 – 2013)

Variable	Unit	Equation	R^2	F	Rate of Growth %	Significance
Al-Arish	Feddan	$\hat{Y} = 275.85 + 1.714XI (3.328)^{**}$	0.626	11.076	0.619	**
Rafah	Feddan	$\hat{Y} = 26.285 + 1.1071 XI (4.91)^{**}$	0.794	24.14	0.036	**
Al-Sheikh Zuwaid	Feddan	$\hat{Y} = 752.85 - 1.392XI (-1.485)$	0.167	2.206	0.0018	*
Bear Al-Abd	Feddan	$\hat{Y} = 2470.42 + 55.18XI (4.463)^{**}$	0.759	19.91	0.021	**
Rommanah	Feddan	$\hat{Y} = 2332.57 - 2.285XI (-2.960)^{**}$	0.564	8.76	0.983	**
Al-Hasanah	Feddan	$\hat{Y} = - + - XI (0.000)$	-	-	-	-
Nakhl	Feddan	$\hat{Y} = 3.428 + 0.00XI (00.000)$	-0.2	-	-	-
Total	Feddan	$\hat{Y} = 8356.85 + 51.928XI (4.190)^{**}$	0.734	17.56	0.061	**

Source: - collected and calculated from Table (13).
$\hat{Y}$ = the estimated value of the area in the year I   -   Xi = variable time, (I) 1, 2 ....7.
A , B= Indicates to reduce hard, and the regression coefficient of the equation, respectively.
(**) Indicates a significant regression model or when the level of significance (0.01).
(*) Refers to the moral at the level of significance (0.05).
R^2 =average coefficient of determination
(F) = F value calculated . ( ) the value in brackets is the calculated value of T.

Eighth: - The evolution of the total varieties of fruitful palms in the Arab state of Egypt during the period (2001-2013):

The Evolution of the Area of the Total Varieties of Palms (females fruiting date palms) in the Arab State of Egypt during the Period (2001-2013): - it is shown from table (15) that the total area of the varieties of palms has been increased from about 11356 feddans in 2001 to about 14595 feddans in 2013, at a rate of increase estimated at about 28.5%. By studying the general time trend of the evolution of the area of the total varieties of palms at the level of the State during the same period, it is shown from table (16) that the area of the total varieties of palms increases by about 266.5 thousand palms, at a significant increasing rate reached to about 0.021% annually of the average of the area of the total varieties of palms at the level of the State that reached to about 12927.2 feddans during study period. The coefficient of determination has reached to about 0.86 which means that 8.6% of the changes in the total varieties of palms at the level of the State are due to the factor of time.

The Evolution of the Varieties of Palms (Females Fruiting Date Palms) in the Arab State of Egypt for the Period (2001 – 2013): - it is shown from table (15) that the number of fruitful females in the Arab State of Egypt has been increased from about 786.387 thousand palms in 2001 to about 1116.541 thousand palms in 2013, at a rate of increase estimated at about 41.1%. By studying the general time trend of the numbers of females fruiting date palms in the Arab State of Egypt during the same period, it is shown from table No (16) that the numbers fruitful females increases by about 24.10 thousand palms, at a significant rate of increase reached to about 0.0028% annually of the average of the number of fruitful females in the Arab State of Egypt that reached to about 878.208 thousand palms during study period. The coefficient of determination has reached to about 0.056 which means that 5.6% of the changes in the number of fruitful females at the level of the State are due to the factor of time.

The Evolution of the Productivity of the Varieties of Palms at the Level of the Arab State of Egypt during the Period (2001 – 2013): -

It is shown from table (15) that the average of the productivity of the varieties of palms has reached to about 72.5 kg / palm in 2001. It fluctuates between increase and decrease until it reached to about 111.7 kg / palm at a proportion of increase estimated at about 54.1%. By studying the general time trend of the average of

the productivity of palms' varieties at the level of the Arab State of Egypt during the same period, it is shown from table (16) that the average of the productivity of palms' varieties at the level of the Arab State of Egypt increases by about 0.71 kg / palm, at a significant increasing rate reached to about 0.0096% annually of the average of the productivity of palms' varieties at the level of the Arab State of Egypt that reached to about 73.4 kg / year at the level of the State. The coefficient of determination has reached to about 0.066 which means that 6.6% of the changes in the average of the productivity of palms' varieties at the level of the Arab State of Egypt are due to the factor of time.

The Evolution of the Total Production of Palms' Varieties at the Level of the Arab State of Egypt during the Period (2001 – 2013): -

The evolution of the total production of palms' varieties at the Level of the Arab State of Egypt is shown from table (15), as it reached to about 57.024 thousand tons in (2001), and it increases gradually until it reached to about 124.704 thousand tons in (2013). The rate of increase has estimated at about 118.6% for 2001. By studying the general time trend of the total production of palms' varieties during the same period, it is shown from table (16) that the total production increases by about 2.76 thousand tons, at a significant increasing rate reached to about 0.0039% annually of the average of the total production of palms' varieties that reached to about 2569.6 thousand tons at the level of the State. Moreover, the statistical significance of that increase has been fixed, and the coefficient of determination has reached to about 0.152 which means that 1.5% of the changes in the total production of palms' varieties are due to the increase in the number of fruitful females resulting from cultivating new areas of palms, in addition to the increase in the productivity per feddan.

Table 15: The total of date palms' varieties and fruitful females at the level of the state during the period (2001 – 2013)

Year	Total Varieties The Area per Feddan	The Number of Fruitful Females Palm	The Average of Productivity Kg / Palm	The Total Production / Ton
2001	11356	786387	72.51	57024
2002	11815	812915	80.84	65715
2003	11925	903486	79.94	72222
2004	12459	879282	79.94	70286
2005	12736	907694	79.78	72418
2006	12341	895929	73.61	65945
2007	12033	94133	50.02	45228
2008	12573	931019	49.45	46036
2009	13498	985814	50.09	49384
2010	13881	969620	53.21	51597
2011	14366	1046195	81.97	85754
2012	14475	1087690	90.85	98816
2013	14595	1116541	111.69	124706
Total	168053	11416705	953.9	905131
Average	12927.2	878208	73.37	69625.5

Source: - Ministry of Agriculture and Land Reclamation, Economic Affairs Sectors, the Central Administration of Agricultural Economics, bulletins of Agricultural Economics, various issues

Table 16: Estimating the features of the general time trend of some of the total of date palms' varieties and fruitful females at the level of the state during the period (2001 – 2013)

Variable	Unit	Equation	R^2	F	Rate of Change %	Significance
The Total Varieties	Feddan	$Y^\wedge = 11061 + 266.593XI$ (8.93)**	0.867	79.83	0.021	**
Fruitful Females	Palm	$Y^\wedge = 70943 + 24109.77 XI$ (1.313)*	0.0568	1.723	0.028	*
The Average of Productivity	Kg / palm	$Y^\wedge = 68.395 + 0.7116XI$ (0.503)*	0.066-	0.253	0.0096	*
The Total Production	Ton	$Y^\wedge = 50253.11 + 2767.47XI$ (1.779)*	0.153	3.167	0.0039	*

Source: - collected and calculated from Table (15).
$Y^\wedge$= the estimated value of the area in the year Xi = variable time, (I) 1, 2 ....13.
A , B= Indicates to reduce hard, and the regression coefficient of the equation, respectively.
(**) Indicates a significant regression model or when the level of significance (0.01).
(*) Refers to the moral at the level of significance (0.05).
R^2 =average coefficient of determination
(F) = F value calculated ( ) the value in brackets is the calculated value of T.

Marketing Problems: -

There are a lot of marketing problems facing the planters of palms, and these problems including:

-There are no marketing outlets, in the villages, and marketing bodies like cooperatives, and the increase in the proportion of losses.
-The unavailability of the silos needed to fill in the crop and the low storage efficiency. 3- There are bad varieties and the fruits are mixed without being sorted and graded.
-There are problems, during selling, in terms of equality, estimating the value of crop and the low prices of selling at the farm level compared to the prices of consumers.
-The reduced demand for palm wastes, and the monopoly of factory owners (wholesalers) to farmers.

Recommendations: -

-Giving an attention to the factors affecting palm productivity, which are palm's age, the amount of organic fertilizer, the amount of effective nitrogen fertilizer and the total of the used pesticides.
-It is necessary to provide seedlings with good qualities and there is a necessity to provide guiding supervision on palm trees and plant them in assembled units.
-Providing the requirements of production in prices suitable for planters.
-Forming cooperative societies in order to market and export dates, providing containers suitable for mobilizing the crop and providing places suitable for storage.

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